Cisco UCS Diagnostics User Guide for B-Series Servers, Release 1.0

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Preface

This preface includes the following sections:

- Audience, page v
- Conventions, page v
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Audience

This guide is intended primarily for data center administrators with responsibilities and expertise in one or more of the following:

- Server administration
- Storage administration
- Network administration
- Network security

Conventions

Text Type	Indication
GUI elements	GUI elements such as tab titles, area names, and field labels appear in **this font**. Main titles such as window, dialog box, and wizard titles appear in **this font**.
Document titles	Document titles appear in *this font*.
TUI elements	In a Text-based User Interface, text the system displays appears in `this font`.
System output	Terminal sessions and information that the system displays appear in `this font`.

Text Type	Indication
CLI commands	CLI command keywords appear in **this font**. Variables in a CLI command appear in *this font*.
[ ]	Elements in square brackets are optional.
{x | y | z}	Required alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
< >	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the document.

Tip Means *the following information will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.

Caution Means *reader be careful*. In this situation, you might perform an action that could result in equipment damage or loss of data.

Timesaver Means *the described action saves time*. You can save time by performing the action described in the paragraph.

Warning IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Related Documentation

UCS Documentation Roadmaps

For a complete list of all B-Series documentation, see the *Cisco UCS B-Series Servers Documentation Roadmap* available at the following URL: http://www.cisco.com/go/unifiedcomputing/b-series-doc.

For a complete list of all C-Series documentation, see the *Cisco UCS C-Series Servers Documentation Roadmap* available at the following URL: http://www.cisco.com/go/unifiedcomputing/c-series-doc.

Other Documentation Resources

An ISO file containing all B and C-Series documents is available at the following URL: http://www.cisco.com/cisco/software/type.html?mdfid=283853163&flowid=25821. From this page, click **Unified Computing System (UCS) Documentation Roadmap Bundle**.

The ISO file is updated after every major documentation release.

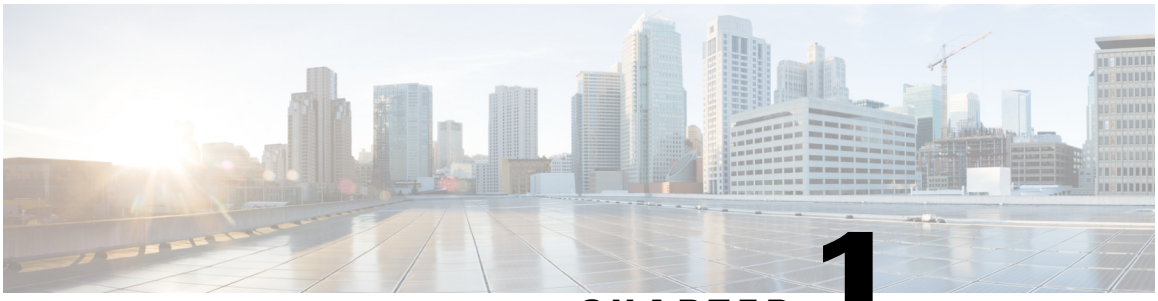
Follow Cisco UCS Docs on Twitter to receive document update notifications.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly What's New in Cisco Product Documentation, which also lists all new and revised Cisco technical documentation.

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS version 2.0.

Follow Cisco UCS Docs on Twitter to receive document update notifications.



CHAPTER 1

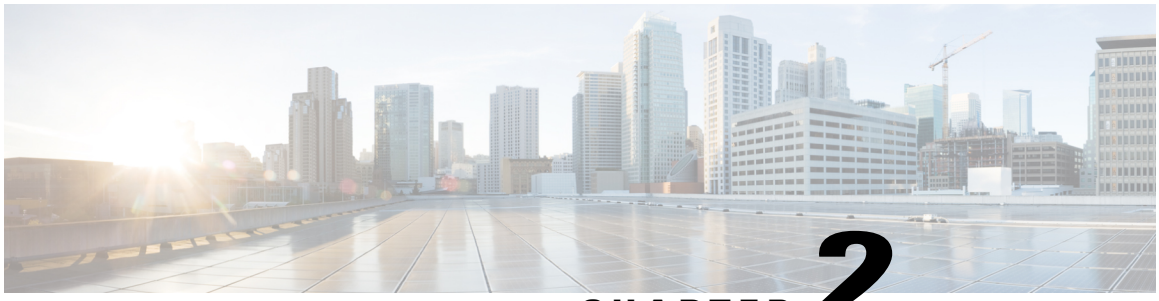
Overview of UCS Blade Server Diagnostics

This chapter contains the following sections:

- Overview of Cisco UCS Diagnostics for Cisco UCS B-Series Blade Servers, page 1

Overview of Cisco UCS Diagnostics for Cisco UCS B-Series Blade Servers

Cisco UCS Blade Server Diagnostics tool for Cisco UCS Blade Servers enables you to verify the health of the hardware components on your servers. The diagnostics tool provides a variety of tests to exercise and stress the various hardware subsystems on the Cisco UCS Blade Servers, such as memory and CPU. You can use the tool to run a sanity check on the state of your Cisco UCS Blade Servers after you fix or replace a hardware component. You can also use this tool to run comprehensive burn-in tests before you deploy a new Cisco UCS Blade Server in your production environment.



CHAPTER 2

Getting Started with Cisco UCS Blade Server Diagnostics

This chapter contains the following sections:

- Obtaining the Cisco UCS Blade Server Diagnostics ISO Image, page 3
- Launching Cisco UCS Blade Server Diagnostics, page 4

Obtaining the Cisco UCS Blade Server Diagnostics ISO Image

Use the following steps to download the Cisco UCS Blade Server Diagnostics ISO image from the Cisco website.

Procedure

Step 1 From your browser, navigate to the following URL: http://www.cisco.com/cisco/software/navigator.html.

Step 2 From the **Downloads Home** table, in the middle column, click **Servers - Unified Computing**.

Step 3 From the right column in the table, click **Cisco UCS B-Series Blade Server Software**.

Step 4 In the Select a Software Type list, choose **Unified Computing System (UCS) Diagnostics.**
The Download Software screen appears listing the release version and the ISO image for the Cisco UCS Blade Server Diagnostics tool.

Step 5 Click **Download** to download the ISO file.

Step 6 Verify the information on the next page, and then click **Proceed With Download**. If prompted, use your cisco.com credentials to log in.

Step 7 Continue through the screens to accept the license agreement and to browse to a location where you want to save the ISO file.

Launching Cisco UCS Blade Server Diagnostics

The Cisco UCS Blade Server Diagnostics tool is a bootable image that is based on a 64-bit Linux kernel. You can load multiple instances of the ISO image on different blades and run the tests on multiple blades at the same time. The diagnostics tool provides both GUI and CLI interfaces for you to view the server inventory, run diagnostic tests, and view log files and test results. You can boot the image by using the Cisco UCS Manager KVM remotely using virtual media.

About KVM Console

You can use Cisco Integrated Management Controller (CIMC) Console to launch the diagnostics tool with virtual media. KVM Console is an interface accessible from CIMC that emulates a direct keyboard, video, and mouse (KVM) connection to the server. KVM Console enables you to connect to the server from a remote location.

Note KVM Console requires Java Runtime Environment (JRE) version 1.5.0 or higher. However, if you are using Cisco UCS Manager release 1.4, 2.0(1), and 2.0(2), make sure that you do not have JRE versions 1.6x or higher installed. JRE versions 1.7 and higher are only supported on Cisco UCS Manager releases 2.0(3) and higher.

KVM Console has the following tabs:

- **KVM—**Displays the diagnostics tool when it is booted.
- **Virtual media—**Maps the following media to a virtual drive:
  - CD/DVD on your computer or your network
  - Disk image files (ISO or IMG files) on your computer or your network
  - USB flash drive on your computer

Using KVM Console

Before You Begin

- Download the Cisco UCS Blade Server Diagnostics ISO image file from cisco.com. For information about how to download the image, see Obtaining the Cisco UCS Blade Server Diagnostics ISO Image, on page 3.
- To access KVM Console for booting the diagnostics tool, make sure that you have a service profile associated with the Cisco UCS Blade Server against which you want to run the tests.

Procedure

Step 1 If you do not have access to the Cisco UCS Manager, perform the following steps. Otherwise skip to step 2.

a) Log into the KVM Manager and choose the service profile that is associated to your Cisco UCS Blade Server.
b) Launch KVM and provide your credentials.
c) Skip to step 5.

Step 2 Log into Cisco UCS Manager and provide your credentials.

Step 3 Choose the **Equipment > Chassis** tab.

Step 4 Choose the Cisco UCS Blade Server.

Step 5 From the **Action** pane, click **KVM Console**.

Step 6 Click the **Virtual Media** tab (Tools tab for Cisco UCS 1.4 and earlier releases).
The **Virtual Media** tab appears.

Step 7 Click **Add Image**.

Step 8 Navigate to and choose the ISO file, and click **Open**.

Step 9 In the **Client View** section, check the check box in the **Mapped** column for the ISO file that you added and then wait for the mapping to complete.
KVM Console displays the progress in the **Details** section.

Step 10 Click the **Reset** button from your KVM Console to reboot your server.

Step 11 Press **F6** when the server starts to select a boot device.
The **Boot Selection** menu appears. If you do not see the **KVM mapped DVD** option, modify the **Boot Policy** to loose.

Note Alternately, you can create a boot policy for the service profile. For more information about how to create a boot policy, see the Creating a Boot Policy section in the *Cisco UCS Manager GUI Configuration Guide, Release 2.1*.

Step 12 Use the arrow keys to choose Cisco Virtual CD/DVD and then press Enter.
The server boots using the Cisco UCS Blade Server Diagnostics image and launches the application in the **KVM** tab.

Exiting Cisco UCS Blade Server Diagnostics

Before You Begin

Before you exit the diagnostics tool, make sure that all your test are completed.

Procedure

Step 1 Remove the .iso disk from the virtual media.

Step 2 Click **Reset** and then click **Yes** to confirm.

Launching an ISO Image Using the USB Drive

Use the following steps to launch an ISO image using the USB drive.

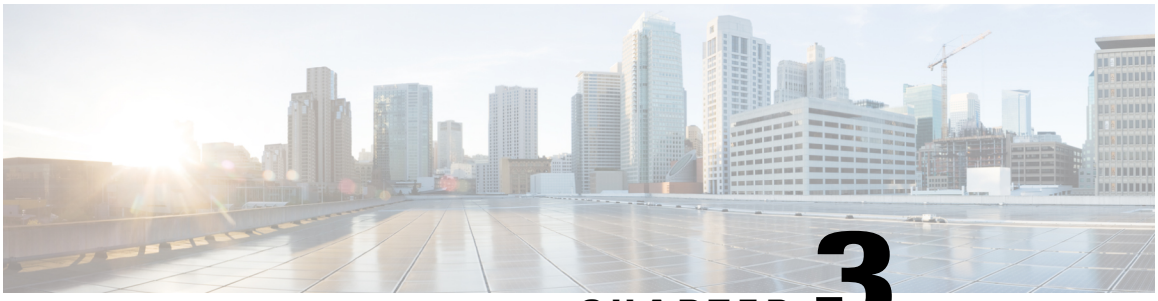
Procedure

Step 1 Start with a FAT32 formatted USB flash drive.

Step 2 Extract the contents of the diagnostics ISO image into the USB flash drive.

Step 3 Open the flash drive and find the directory MAKE_USB. Navigate to Windows.

Step 4 Right-click makeboot.bat and click Run as Administrator. Follow the instructions on the prompt that comes up.
Your USB flash drive is now bootable with the diagnostic image. If you are updating a pre-existing diagnostic image, only the file kernel needs to be replaced on the flash drive.



CHAPTER 3

Using the Cisco UCS Blade Server Diagnostics User Interface

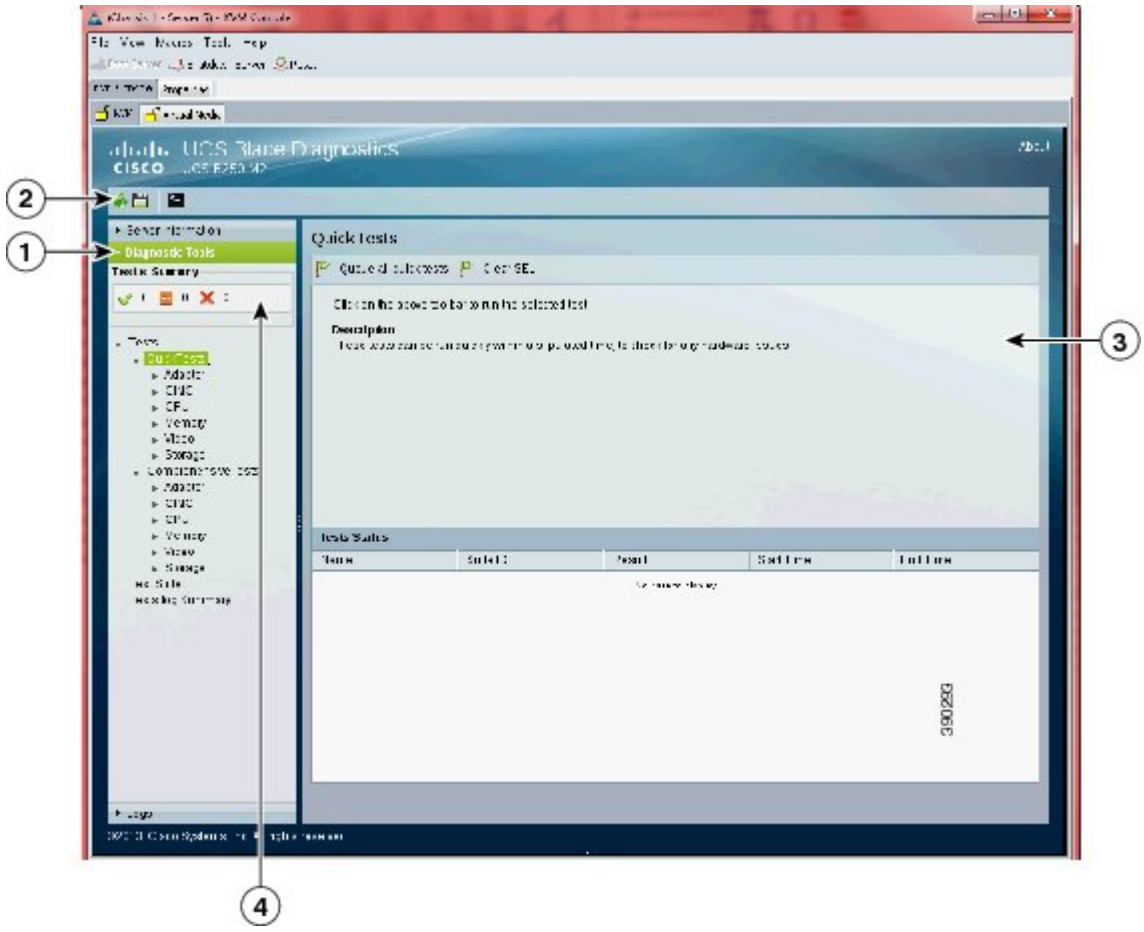
This chapter contains the following sections:

- Understanding the UCS Blade Server Diagnostics Graphical User Interface, page 8

Understanding the UCS Blade Server Diagnostics Graphical User Interface

The following figure explains the UI components of the diagnostics tool.

Figure 1: Cisco UCS Blade Server Diagnostics GUI



1	**Navigation pane**
2	**Toolbar**
3	**Content pane**
4	**Tests Summary panel**

The following table provides the description of each element in the UI.

Table 1: UI Elements

Navigation pane	Displays the options that you can choose, such as **Server Information**, **Diagnostic Tools**, or **Logs**.
Toolbar	Displays the quick icons on the top-left corner of the window. The options displayed are **Save Logs**, **Enter CLI mode**, and **Refresh**.
Content pane	Displays the details about an option that you choose in the **Navigation pane**, for example, the details about a server, information about all the tests within a test suite, or log details. Displays on the right side of the GUI. In the lower part of the **Contents** pane, the tests results are displayed in the **Test Status** area.
Tests Summary panel	Displays a quick summary of all the tests that are completed successfully, tests in queue, and tests that failed. This component is visible only when you choose the **Diagnostic Tools** option in the **Navigation pane**.

The following table describes the elements in the **Navigation pane**.

Table 2: Navigation Options

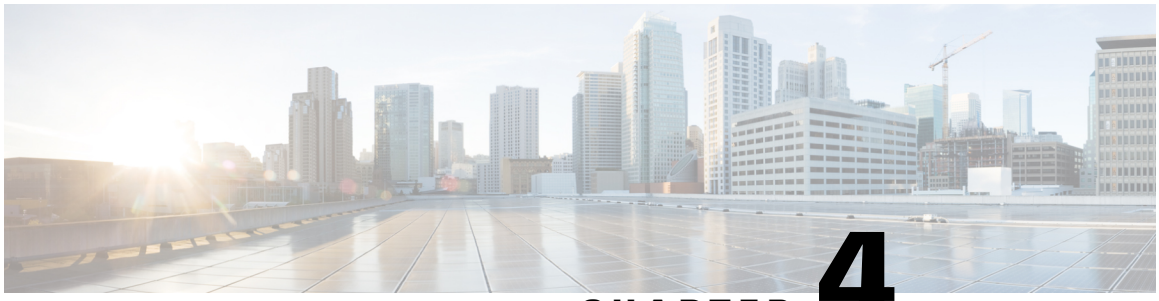
Server Information	Overview	Displays server properties, such as the manufacturer name and product name, and Server Summary, CPU Processors, and CPU Cores.
	Inventory	Displays detailed information about CPUs, Memory, IO, Storage, BIOS, CIMC, and PCI.
	Status	Displays the health of the subsystems on your server such as CPUs, memory, storage, Peripheral Component Interconnect (PCI) devices, BIOS, and CIMC.
	Sensors	Displays current sensor readings, such as memory temperature and error codes (ECC), from Intelligent Platform Management Interface (IPMI). **Note** If the blade server crashes during the stress test and the SEL displays double ECC error after booting up, replace the affected DIMM on the server.
Diagnostic Tools		Enables you to run various types of diagnostic tests to detect server failures. For more information about Diagnostic Tools, go to About Diagnostic Tools.

Logs		Displays the System Log and System Event Log of your server using the links to the following windows: • System Logs • System Event Log For more information about Logs, see About Viewing Logs.

The following table lists and describes all the icons in the diagnostics tool that you can use to perform specific tasks.

Table 3: Toolbar Buttons

Toolbar Icon	Name	Function
	Save Logs	Saves logs to a USB drive.
	Refresh	Refreshes the content area, if supported.
	Enter CLI mode	Returns to the CLI mode.
	Reboot	Reboot the server.



CHAPTER 4

Using Cisco UCS Blade Server Diagnostics Test Components

This chapter contains the following sections:

- About the Cisco UCS Blade Server Diagnostics Test Components, page 11

About the Cisco UCS Blade Server Diagnostics Test Components

The diagnostics tool provides several options for you to run and review the diagnostics tests for your Cisco UCS Blade Servers. The following table describes the various diagnostics options. The table also outlines the test components by their functions.

Table 4: Diagnostics Test Components and Functions

Diagnostic Test Component	Function
Memtest 86	Runs memory tests when the server is booting up. The components that are tested are multiple CPU caches and memory DIMMs.
Quick Test	Quickly checks the status of a server or runs sanity checks on the status of individual subsystems of a server. The components that you can test using this option are CIMC, CPU, storage, and memory.
Comprehensive Test	Runs exhaustive tests on a server or an independent subsystem of a server. Use these tests to stress the subsystems and report errors. You can run comprehensive tests on CIMC, CPU, memory, and video.
Test Suite	Creates a suite of tests using tests from the comprehensive test options to customize per your requirements. You can choose any combination of tests as you like (using a check box).

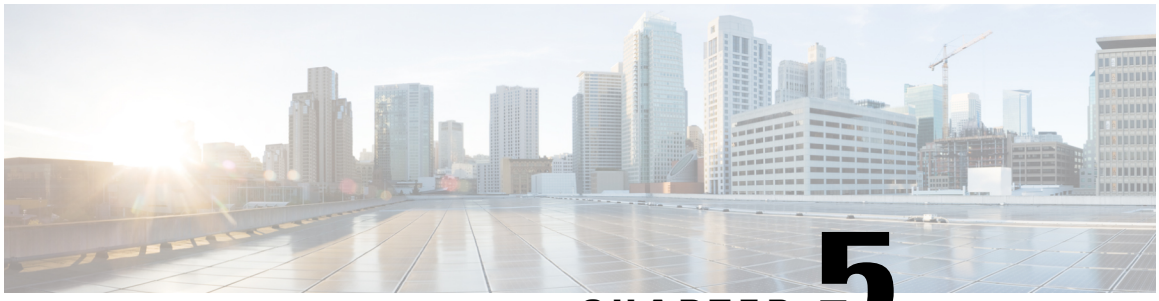
Diagnostic Test Component	Function
Tests Log Summary	Displays an error log and analysis of all the tests that you have run. You can use four filters to sort the logs: Name, Test Suite, Status, and Result.

The following table lists the tests by their functional areas.

Table 5: Diagnostics Tests by Functional Area

Functional Area	Test Name	Description
CIMC	CIMC Selftest	Uses the `ipmitool` to verify that CIMC is operating and is able to provide IPMI data.
CPU	CPU Stress	Stress tests the CPUs.
	CPU Stream	Stress tests the CPU using the stream benchmark.
	CPU Cache	Stress tests the cache in-parallel on all processors.
	CPU Register	Tests the CPU register access.
Memory	Memory Noise	Checks the susceptibility of memory cells that are being affected by signal transactions and cell content changes in the memory array.
	Memory Random	Sequentially writes random data to memory, verifies, writes a complement, verifies, and increments seed for the next loop.
	Memory March	For each loop, writes 0, reads 0/writes 1 (up direction), reads 1, writes 0/reads 0 (down direction) .
	Memory Walk	For each loop, walks ones, and then walks zeros (64-bit data).
	Memory Address	Based on the memory range that you selected for the test, writes the 32-bit or 64-bit address for each single-word or double-word memory block for each loop.
	Memory Pattern	Uses an 8-bit pattern, which is a random number and its complement, to detect data sensitive errors. The random number sequence is different with each pass, which increases effectiveness with multiple passes.
	Memory Butterfly	For each loop, writes and then verifies the address and address complement in the next address (64-bit data).

Functional Area	Test Name	Description
Video	Video Memory Stress **Note** This test is not available in Quick test mode.	Runs stress tests on the video memory. The test stresses the graphics card by drawing different graphical patterns on the screen. This test is available in the GUI mode only.
Storage	Storage S.M.A.R.T	Reports the storage Self-Monitoring Analysis and Reporting Technology (S.M.A.R.T) status.
	Storage Selftest	Runs the storage controller self-test. **Note** This test is available on all servers with MegaRAID controllers. This test is not available for B200M2 and B250M2, because these two servers do not come with MegaRAID controllers.



CHAPTER 5

Viewing Server Information

This chapter contains the following sections:

- About Server Information, page 15
- Viewing Server details, page 15

About Server Information

The **Server Information** section displays the following information about your server:

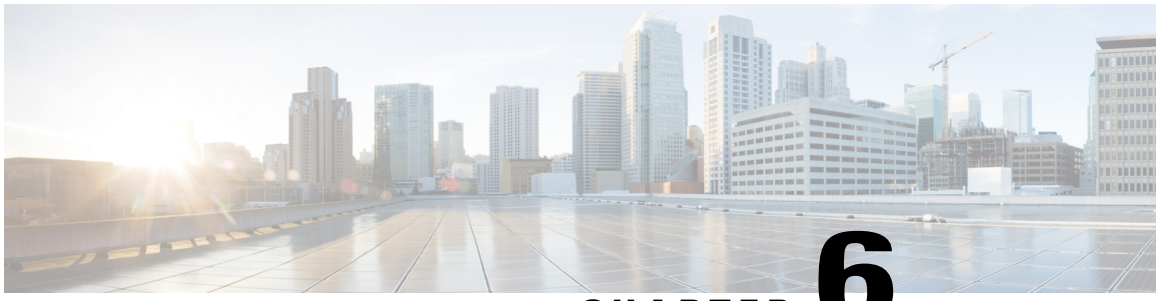
- **Overview—**Displays server properties, such as the manufacturer name and product name, and Server Summary, CPU Processors, and CPU Cores.
- **Inventory—**Displays detailed information about CPUs, Memory, IO, Storage, BIOS, and PCI.
- **Status—**Displays the health of the subsystems on your server such as CPUs, memory, storage, Peripheral Component Interconnect (PCI) devices, BIOS, and CIMC.
- **Sensors—**Displays current sensor readings, such as memory temperature and error codes (ECC), from Intelligent Platform Management Interface (IPMI).

Viewing Server details

Procedure

Step 1 In the **Navigation** pane, expand **Server Information**.

Step 2 Click the option for which you want to display the details in the **Contents** pane.
For example, click **Inventory** to view information about your server's subsystems.



CHAPTER 6

Running Diagnostic Tests Using the GUI

This chapter contains the following sections:

- About Quick Tests, page 17
- Running Quick Tests, page 17
- About Comprehensive Tests, page 18
- Running Comprehensive Tests, page 18
- About Test Suites, page 18
- Running Tests in a Test Suite, page 18

About Quick Tests

Quick tests performs a quick diagnostics of your server components to determine any hardware issues or failures. Depending on the Cisco UCS Server that you are using and the memory available on your server, these tests usually take 20 to 30 minutes to quickly test the overall functionality of your main subsystems.

Running Quick Tests

Procedure

Step 1 In the **Navigation** pane, expand **Diagnostic Tools**.

Step 2 Expand **Tests**.

Step 3 Click **Quick Tests**.

Step 4 In the **Contents** pane, click **Run all Quick Tests**.

Note You can run all quick tests, or expand **Quick Tests** to choose individual options.

Step 5 Click **Tests log Summary** to view all tests that are currently in the queue.

The tests are run in the order as listed in the **Test Suite** table. The results are displayed in the **Test Status** area in the **Contents** pane.

Step 6 To clear the system events log, in the **Contents** pane, click **Clear SEL**.

About Comprehensive Tests

Comprehensive tests can run for several hours or days. These tests run exhaustive burn-in tests on your server, such as stress tests. The tests are designed to test multiple hardware components and find issues that might be caused by multiple components on your server.

Running Comprehensive Tests

You can customize comprehensive tests to diagnose specific conditions based on your requirements.

Procedure

Step 1 In the **Navigation** pane, expand **Diagnostic Tools**.

Step 2 Expand **Tests**.

Step 3 Click **Comprehensive Tests**.

Step 4 In the **Contents** pane, click **Run all comprehensive tests**.

Note You can run all comprehensive tests, or expand **Comprehensive Tests** to choose individual options.

Step 5 Click **Tests log Summary** to view all tests that are currently in the queue.
The test is run in the order as listed in the **Test Suite** table. The results are displayed in the **Test Status** area in the **Contents** pane.

Step 6 To clear the system events log, in the **Contents** pane, click **Clear SEL**.

About Test Suites

You can run more than one test at the same time using a test suite. Each test that you select is run consecutively, and the results are displayed in the **Test Status** area in the **Contents** pane.

Running Tests in a Test Suite

Note Running tests in a suite is available from the GUI mode only.

Procedure

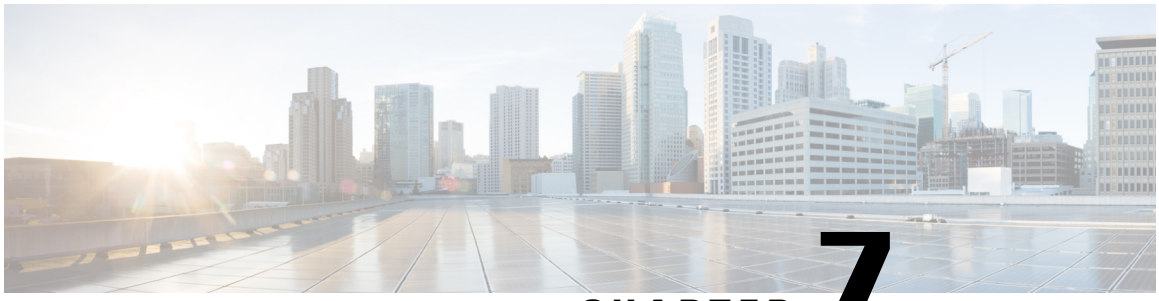
Step 1 In the **Navigation** pane, expand **Diagnostic Tools**.

Step 2 Click **Test Suite**.

Step 3 In the **Contents** pane, check the check box for the tests that you want to run in the suite.

Step 4 In the **Contents** pane, click **Run Tests Suite**.
The tests are added to the **Test Suite** queue.

Step 5 In the **Navigation** pane, click **Tests Log Summary** to view the execution status of these tests.



CHAPTER 7

Running Diagnostics Tests Using the CLI

This chapter contains the following sections:

- About Running Tests Using the CLI, page 21
- Running Tests Using the CLI, page 21

About Running Tests Using the CLI

You can run both Comprehensive and Quick tests from the CLI, as well as individual tests. Running tests in a test suite is not available in the CLI.

Running Tests Using the CLI

Before You Begin

To start running CLI commands, choose the **Offline Diagnostic (CLI)** option from the Cisco UCS ME Server Diagnostics splash screen, or click the **Enter CLI mode** button from the GUI mode.

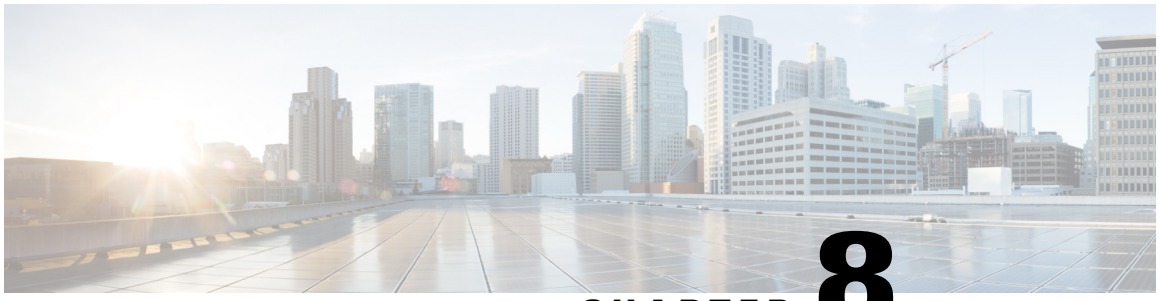
Procedure

	Command or Action	Purpose
Step 1	diag# {**cimc** | **clear** | **comprehensive cpu** | **exit** | **gui** | **memory** | **pci** | **quick** | **reboot** | **saveusb** | **server** | **show** | **smbios**}	Type the help ? after the command to view a list of subcommands. For a detailed list of all tests that are available from the CLI, see CLI Tests and Descriptions, on page 25.

The following example shows how to run a cimc selftest:

```
diag# cimc selftest
    Running cimc selftest:
```

```
    CimcSelfTest passed
diag#
```



CHAPTER 8

Viewing Logs

This chapter contains the following sections:

- Viewing System Logs, page 23
- Viewing System Event Logs, page 23

Viewing System Logs

By viewing system logs, you can determine if any error has occurred and take the required corrective action.

The system log file displays events that are logged by the operating system components. These events are often predetermined by the operating system itself. System log files display information about device changes, device drivers, system changes, events, and operations.

Procedure

Step 1 In the **Navigation** pane, expand **Logs**.

Step 2 Click **System Logs**.

Step 3 From the **Filter** drop-down list, choose a filter.

Step 4 Click **Go**.
The system log is displayed.

Viewing System Event Logs

The system event log file displays events that are logged by your server.

Procedure

Step 1 In the **Navigation** pane, click **Logs**.

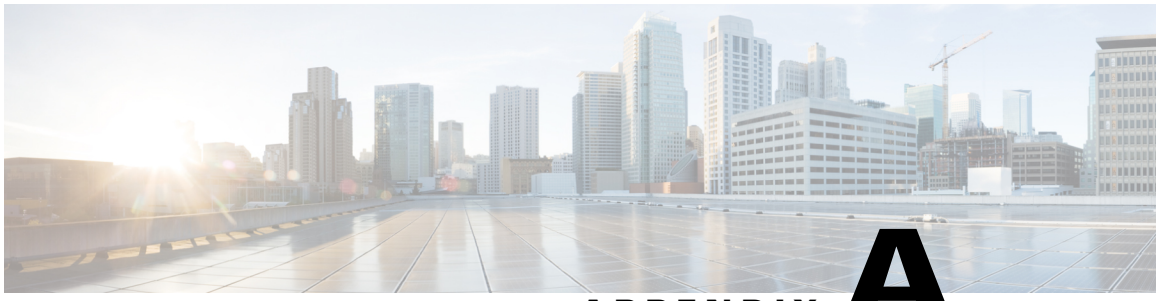
Step 2 Click **System Event Log**.

Step 3 In the **Contents pane** from the **Filter** drop-down list, choose one of the following.

- **Description—**Displays all the system event logs with the specified description and severity.
- **Severity—**Displays only those errors from the logs that are of the specified severity.

Step 4 Click **Go** to view the results.

Step 5 Click **Clear Filter** to clear an existing filter.



APPENDIX A

Command Reference for the CLI

This chapter contains the following topics:

- CLI Tests and Descriptions, page 25
- CLI Additional Commands, page 27

CLI Tests and Descriptions

The following table lists the CLI commands for the corresponding diagnostics tests. The tests are listed by category.

Note Some tests are only available as comprehensive tests.

Category	Test Name	CLI Command	Options
CIMC	Selftest	cimc selftest	[count][duration] • [count]—Number of loops to run; default 2. • [duration]—Number of minutes to run the test; the default is 10.
CPU	Stress	cpu stress	[duration] The duration in minutes. The default is 2.
	Stream	cpu stress	No options are available.
	Temperature	cpu temperature	No options are available.
	Cache	cpu cache	[duration] The duration in minutes. The default is 4.

Category	Test Name	CLI Command	Options
	Register	cpu register	No options are available.
Memory	Noise	memory noise	[loops][size] • [loops—Number of loops to run; default 5 • [size]—Size of memory to test (example: 10 GB, 500 MB); the default is all. You can also run this test in the background.
	Random address	memory random	[loops][size] • [loops]— Number of loops to run; default 1. • [size]—Size of memory to test (example: 10 GB, 500 MB); the default is all. You can also run this test in the background.
	March	memory march	[loops][size] • [loops]—Number of loops to run; default 2. • [size]—Size of memory to test (example: 10 GB, 500 MB); the default is all. You can also run this test in the background.
	Walk	memory walk	[loops][size] • [loops]—Number of loops to run; default 1. • [size]—Size of memory to test (example: 10 GB, 500 MB); the default is all. You can also run this test in the background.
	Address	memory address	[loops][size] • [loops]—Number of loops to run; default 1. • [size]—Size of memory to test (example: 10 GB, 500 MB); the default is all. You can also run this test in the background.

Category	Test Name	CLI Command	Options
	Pattern	memory pattern	[loops][size] • [loops]—Number of loops to run; default 1. • [size]—Size of memory to test (example: 10 GB, 500 MB); the default is all. You can also run this test in the background.
	Butterfly	memory butterfly	[loops][size] • [loops]—Number of loops to run; default 2. • [size]—Size of memory to test (example: 10 GB, 500 MB); the default is all. You can also run this test in the background.
Storage	Smart	storage smart	No options are available.
	Selftest	selftest	[duration] Duration in minutes; the default is 10.

CLI Additional Commands

The following table lists the additional commands that you can run in the CLI for the diagnostics tool.

Command Name	Definition	CLI Command
Comment	Adds a comment entry into a test script that you create for batch tests.	!
Run CIMC tests	Runs CIMC self-tests.	cimc selftest
Switch to GUI	Returns to the GUI mode.	gui
List devices on PCI	Lists all devices that are available on the PCI bus.	pci
Reboot server	Reboots the server.	reboot
Save logs	Save the logs to the USB drive.	saveusb
Server information	Displays the basic server details, such as CPU, memory, I/O, storage, BIOS, CIMC.	server
BIOS information	Displays the BIOS information.	smbios

Command Name	Definition	CLI Command
Clear logs	Clears the log and the System Event Logs (SEL) log for the diagnostics tool.	clear diaglogs sellogs
Stop	Stops a test that is already running.	stop (example, memory noise stop)
Help	Displays a list of available commands and sub-commands.	?
Scroll window	Scrolls the CLI window down or up.	Right-click the scroll bar to scroll up and left-click the scroll bar to scroll down.